QC ABSTRACT

NAME OF WORK: Improvements of Roads Drains and Culverts in Ward No 10 (Doddabommasandra)

SL NO	Item Of Work	Name of Test	Frequency of Test/Quantity	Executed Quantity	Number of Tests Required	Number of Tests Conducted
		Materials				
1	Cement	Fineness by dry sieving	One Test		1	1
		Finess by Air permeablity method	One Test		1	1
		Density	One Test		1	1
		Standard Consistency	One Test		1	1
		Initial Setting time	One Test		1	1
		Final Setting time	One Test		1	1
		Soundness (Le Chatelier's Method)	One Test		1	1
		Compressive Strength	One Test		1	1
2	Coarse aggregate(20 mm down size)	SIEVE ANALYSIS	One Test		1	1
		Flakiness Index	One Test		1	1
		Elongation Index	One Test		1	1
		Specific Gravity	One Test		1	1
		Bulk Density(Loose)	One Test		1	1
		Bulk Density(Compacted)	One Test		1	1
		Water Absorption	One Test		1	1
		Aggregate crushing Value	One Test		1	1
		Aggregate Impact Value	One Test		1	1
3	Fine aggregate	SIEVE ANALYSIS	One Test		1	1
		Water Absorption	One Test		1	1
		Specific Gravity	One Test		1	1
		Material finer than 75 micron	One Test		1	1
4	PCC(M20)	Compressive Strength(7days and 28days)	2 set /6-15 cum	7.74	4	4
5	WMM	Sieve Analysis	One Test		1	1
		Impact Value	One Test		1	1
		Flakiness Index	One Test		1	1
		Elongation Index	One Test		1	1
6	BM	SIEVE ANALYSIS	One Test		1	1
		STRIPPING VALUE	One Test		1	1
		Flakiness Index	One Test		1	1
		Elongation Index	One Test		1	1
		IMPACT VALUE	One Test		1	1
		Specific gravity	One Test		1	1
		Water Absorption	One Test		1	1
		Marshal Stability	One Test		1	1
		Marshal flow	One Test		1	1
		Percent air Voids	One Test		1	1
		Percent Voids in mineral Aggregate	One Test		1	1
		Percent Voids filled with Bitumen	One Test		1	1
		Density	One Test		1	1
		Gradation	One Test		1	1

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7	BC	SIEVE ANALYSIS	One Test		1	1
		STRIPPING VALUE	One Test		1	1
		Flakiness Index	One Test		1	1
		Elongation Index	One Test		1	1
		IMPACT VALUE	One Test		1	1
		Specific gravity	One Test		1	1
		Water Absorption	One Test		1	1
		Marshal Stability	One Test		1	1
		Marshal flow	One Test		1	1
		Percent air Voids	One Test		1	1
		Percent Voids in mineral	One Test		1	1
		Percent Voids filled with Bitumen	One Test		1	1
		Density	One Test		1	1
		Gradation	One Test		1	1
8	BITUMEN	Ductility	One Test		1	1
		Softening Point	One Test		1	1
		Penetration	One Test		1	1
		Flash Point	One Test		1	1
		Fire Point	One Test		1	1
9	TACK COAT	Rate of spread	One Test		1	1

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TEST REPORT OF PHYSICAL PROPERTIES OF CEMENT - 53 Grade

Lab ID	:	**CP-2023-03-02-01** **Date: 07-11-22**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements of Roads Drains and Culverts in Ward No 10 (Doddabommasandra)
Agency	:	Sri. N M Shivakumar, No:7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.
Customer's Reference	:	BBMP/EE/BTP/WO/17/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	04-11-22
Sample Type	:	Birla Super 53grade
Reference to BIS codes	:	IS 269:2015 Ordinary Portland cement Specification , IS 4031 (Part 4,5):1988 IS 4031 Part 1 (RA 2021) DETERMINATION OF FINENESS BY DRY SIEVING, Clause 4.4 IS 4031 Part 2, (RA 2018) Determination of Fineness by Blaine Air Permeability Method, Clause 5 IS 4031 Part 3, (RA 2019) Determination of Soundness, Clause 5, Clause 6 IS 4031 Part 4, (RA 2019) Determination of Consistency of Standard Cement Paste, Clause 5 IS 4031 Part 5, (RA 2019) Determination of Initial & Final Setting Time, Clause 5 IS 4031 Part 11, (RA 2019)DETERMINATION OF DENSITY , Clause 6
Date of test	:	05-11-22
Environmental Conditions during test	:	Temperature: 26°C Humidity: 72%

Sl.No.	Physical properties	Results	Requirement as per IS 269:2015
1	Fineness by dry sieving (%)	2.1	_
2	Finess by Air permeablity method (m^2/kg,Min)	284.5	225m^2/kg, Min
3	Density (gm/cc)	3.13	_
4	Standard Consistency (%)	28%	Not specified
5	Initial Setting time	155 minutes	Not less than 30 minutes
6	Final Setting time	260 minutes	Not more than 600 minutes
7	Soundness (Le Chatelier's Method)	2mm	Not more than 10 mm

* The results obtained are satisfactory as per standard requirements.

Note:

The results pertain to the samples received and tested.

All information furnished by Agency/Representative

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Samples will be disposed after 30 days from the date of issue of test certificate

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R.KARTHIK RECHAN
Authorized Signatory
Quality Manager

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Format No: CP/TF/01

TEST REPORT OF PHYSICAL PROPERTIES OF CEMENT - 53 Grade

Lab ID	:	**CP-2023-03-02-01** **Date: 03-12-22**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements of Roads Drains and Culverts in Ward No 10 (Doddabommasandra)
Agency	:	Sri. N M Shivakumar, No:7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.
Customer's Reference	:	BBMP/EE/BTP/WO/17/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	04-11-22
Sample Type	:	Birla Super 53grade
Reference to BIS codes	:	IS 269:2015 Ordinary Portland cement Specification , IS 4031 (Part 4,5):1988 IS 4031 Part 4, (RA 2019) Determination of Consistency of Standard Cement Paste, Clause 5 IS 4031 Part 6, (RA 2019) Determination of Compressive Strength, Clause 6
Date of test	:	05-11-22
Environmental Conditions during test	:	Temperature: 26°C Humidity: 72%

Compressive Strength

Sl.No.	Physical properties	Results	Requirement as per IS 269:2015
1	3 Days	28.5N/mm^2	Not less than 27 N/mm^2
2	7 Days	39.0N/mm^2	Not less than 37 N/mm^2
3	28 Days	58.5N/mm^2	Not less than 53 N/mm^2

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Quality Manager

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TEST REPORT ON COARSE AGGREGATES

Lab ID	:	**CP-2023-03-02-01** **Date: 07-11-22**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements of Roads Drains and Culverts in Ward No 10 (Doddabommasandra)
Agency	:	Sri. N M Shivakumar, No:7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.
Customer Reference	:	BBMP/EE/BTP/WO/17/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	04-11-22
Sample Type/ Size	:	20mm down size coarse aggregate
Reference to BIS codes	:	IS: 383:2016 (Specification for Coarse and fine Aggregates) IS: 2386 :1963(Part - 1,3,4) RA2021 IS 2386 Part 1: Particle Size and Shape IS 2386 Part 3: Specific gravity, Density, Voids,Water Absorption IS 2386 Part 4: Mechanical Properties
Date of test	:	04-11-22

SIEVE ANALYSIS (PARTICLE SIZE DISTRIBUTION) OF 20MM DOWN COARSE AGGREGATE:

Total weight taken : 5000 grams

Sample No.	Sieve No.	Weight Retained in gms	Cumulative Weight Retained in gms	% Cumulative Weight Retained	% Passing	Required as per IS 383:2016
1	40 mm	0	0	0	100	100
2	20 mm	237	237	4.7	95.3	90-100
3	10 mm	2544	2781	55.6	44.4	25-55
4	4.75 mm	2107	4888	97.8	2.2	0-10
5	Pan	112	5000	100	0	_

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TEST REPORT ON COARSE AGGREGATES

Lab ID : **CP-2023-03-02-01** **Date: 07-11-22**

PHYSICAL PROPERTIES

Sl.no	Tests	Result	Requirements as per IS:383-2016
1	Flakiness Index(%)	10.7	Combined Flakiness & Elongation Index Shall not Exceed 40% for Uncrushed & Crushed Aggregate
2	Elongation Index(%)	11.4	
3	Specific Gravity	2.65	_
4	Bulk Density(Loose) (Kg/l)	1.53	_
5	Bulk Density(Compacted) (Kg/l)	1.57	_
6	Water Absorption(%)	0.19	_
7	Aggregate crushing Value(%)	25.6	Max 30% for Aggregates to be used in concrete for wearing Surface, In case Aggregate Crushing Value Exceeds 30% then the test for ten percent fines should be conducted for Aggregates to be used in concrete other than for wearing Surface.
8	Aggregate Impact Value(%)	22.5	30% for Aggregates to be used in concrete for wearing Surface, 45% for Aggregates to be used in concrete other than for wearing Surface.

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Format No: CP/TF/01

TEST REPORT OF FINE AGGREGATE

Lab ID : **CP-2023-03-02-01** **Date: 07-11-22**

Customer : Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.

Address : Vidyaranyapura Sub Division, BBMP, Bangalore.

Project Name : Improvements of Roads Drains and Culverts in Ward No 10 (Doddabommasandra)

Agency : Sri. N M Shivakumar, No:7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.

Customer's Reference : BBMP/EE/BTP/WO/17/2020-21

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 04-11-22

Sample Type : Fine Aggregate

Reference to BIS codes : IS 383 : 2016 (Specification for Coarse and fine Aggregates)
IS: 2386 :1963(Part - 1, 3) RA2021
IS 2386 Part 1: Particle Size and Shape
IS 2386 Part 3: Specific gravity, Density, Voids,Water Absorption

Date of test : 04-11-22

Total weight taken : 1000 grams

Sl.no	Sieve Size	Weight Retained (gms)	Cumulative Weight Retained (gms)	% Cumulative Weight Retained	% Passing	Requirement as per IS 383:2016			
						Grading Zone I	Grading Zone II	Grading Zone III	Grading Zone IV
1	10 mm	0	0	0.0	100.0	100	100	100	100
2	4.75 mm	27	27	2.7	97.3	90-100	90-100	90-100	95-100
3	2.36 mm	55	82	8.2	91.8	60-95	75-100	85-100	95-100
4	1.18 mm	239	321	32.1	67.9	30-70	55-90	75-100	90-100
5	600 micron	205	526	52.6	47.4	15-34	35-59	60-79	80-100
6	300 micron	203	729	72.9	27.1	5-20	8-30	12-40	15-50
7	150 micron	191	920	92.0	8.0	0-10	0-10	0-10	0-15
8	Pan	80	1000	100.0	0.0	---	---	---	---

Result :The tested Sample Conforms to Grading Zone II

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TEST REPORT OF FINE AGGREGATE

Lab ID : **CP-2023-03-02-01** **Date: 07-11-22**

PHYSICAL PROPERTIES

Sl.no	Tests	Result	Requirements as per IS 383:2016
1	Water Absorption(%)	1.5	–
2	Specific Gravity	2.59	–
3	Material finer than 75 micron(%)	8.0	Uncrushed fine Aggregate Max 3%, Crushed Fine aggregate Max 15%, Mixed Fine aggregate Max 12%, Manufactured Fine aggregate Max 10%

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TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID : **CP-2023-03-02-01** **Date: 16/11/2022**

Customer : Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.

Address : Vidyaranyapura Sub Division, BBMP, Bangalore.

Project Name : Improvements of Roads Drains and Culverts in Ward No 10 (Doddabommasandra)

Agency : Sri. N M Shivakumar, No:7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.

Customer's Reference : BBMP/EE/BTP/WO/17/2020-21

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 11-11-22

Customer ID : PCC

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M20 / 7 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 (RA 2018) Methods of Tests for Strength of Concrete Cl.5

Date of test : 16/11/2022

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	PCC	M20	09/11/2022	16/11/2022	151.78 X 151.89 X 150.65	23054	8.586	419.0	18.2	18.1
2	PCC	M20	09/11/2022	16/11/2022	149.78 X 149.38 X 151.68	22373	8.265	403.0	18.0	
3	PCC	M20	09/11/2022	16/11/2022	149.94 X 149.30 X 151.55	22386	8.808	404.5	18.1	

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TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID	:	**CP-2023-03-02-01** **Date: 07/12/2022**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements of Roads Drains and Culverts in Ward No 10 (Doddabommasandra)
Agency	:	Sri. N M Shivakumar, No:7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.
Customer's Reference	:	BBMP/EE/BTP/WO/17/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	11-11-22
Customer ID	:	PCC
Sample Type /Size	:	150X150X150 mm
Sample grade/Age	:	M20 / 28 Days Compressive Strength
Reference to BIS codes	:	IS: 516 - 1959 (RA 2018) Methods of Tests for Strength of Concrete Cl.5
Date of test	:	07/12/2022

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	PCC	M20	09/11/2022	07/12/2022	151.22 X 149.25 X 151.27	22570	8.164	528.0	23.4	23.1
2	PCC	M20	09/11/2022	07/12/2022	151.83 X 149.73 X 151.42	22734	9.040	514.4	22.6	
3	PCC	M20	09/11/2022	07/12/2022	149.40 X 149.79 X 151.05	22378	8.141	519.9	23.2	

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TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID : **CP-2023-03-02-01** **Date: 16/11/2022**

Customer : Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.

Address : Vidyaranyapura Sub Division, BBMP, Bangalore.

Project Name : Improvements of Roads Drains and Culverts in Ward No 10 (Doddabommasandra)

Agency : Sri. N M Shivakumar, No:7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.

Customer's Reference : BBMP/EE/BTP/WO/17/2020-21

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 11-11-22

Customer ID : PCC

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M20 / 7 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 (RA 2018) Methods of Tests for Strength of Concrete Cl.5

Date of test : 16/11/2022

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	PCC	M20	09/11/2022	16/11/2022	150.69 X 151.98 X 150.08	22901	8.240	415.3	18.1	18.3
2	PCC	M20	09/11/2022	16/11/2022	151.49 X 150.90 X 149.08	22860	9.055	419.8	18.4	
3	PCC	M20	09/11/2022	16/11/2022	150.13 X 149.42 X 150.96	22432	8.376	409.6	18.3	

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TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID	:	**CP-2023-03-02-01** **Date: 07/12/2022**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements of Roads Drains and Culverts in Ward No 10 (Doddabommasandra)
Agency	:	Sri. N M Shivakumar, No:7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.
Customer's Reference	:	BBMP/EE/BTP/WO/17/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	11-11-22
Customer ID	:	PCC
Sample Type /Size	:	150X150X150 mm
Sample grade/Age	:	M20 / 28 Days Compressive Strength
Reference to BIS codes	:	IS: 516 - 1959 (RA 2018) Methods of Tests for Strength of Concrete Cl.5
Date of test	:	07/12/2022

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	PCC	M20	09/11/2022	07/12/2022	150.63 X 149.34 X 150.63	22495	8.140	534.1	23.7	23.3
2	PCC	M20	09/11/2022	07/12/2022	149.17 X 150.63 X 151.26	22469	8.737	503.6	22.4	
3	PCC	M20	09/11/2022	07/12/2022	149.51 X 150.77 X 149.88	22542	8.348	534.7	23.7	

* The results obtained are satisfactory as per standard requirements.

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Quality Manager

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TEST RESULTS OF GRADATION FOR WMM

Lab ID : **CP-RW-2023-03-02-01** **Date: 17-11-22**

Customer : Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.

Address : Vidyaranyapura Sub Division, BBMP, Bangalore.

Project Name : Improvements of Roads Drains and Culverts in Ward No 10 (Doddabommasandra)

Agency : Sri. N M Shivakumar, No:7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.

Customer Reference : BBMP/EE/BTP/WO/17/2020-21

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 15-11-22

Type of Mix : WMM (Wet Mix Macadam)

Date of Test : 15-11-22

Oven Dry Weight : 11000 Grams

IS Sieve Size(mm)	Weight Retained (gm)	Cumulative Weight Retained (gm)	% Cumulative Weight Retained	% Passing	Spec.I.Vide Table 400.13 MORTH Specification
53	0	0	0.0	100.0	100
45	315	315	2.9	97.1	95-100
22.4	2259	2574	23.4	76.6	60-80
11.2	2179	4753	43.2	56.8	40-60
4.75	2251	7004	63.7	36.3	25-40
2.36	1621	8625	78.4	21.6	15-30
0.6	623	9248	84.1	15.9	8-22
0.075	1338	10586	96.2	3.8	0-5

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TEST REPORT OF AGGEGRATE IMPACT VALUE
IS: 2386 Part IV

Lab ID	:	**CP-RW-2023-03-02-01** **Date: 17-11-22**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements of Roads Drains and Culverts in Ward No 10 (Doddabommasandra)
Agency	:	Sri. N M Shivakumar, No:7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.
Customer Reference	:	BBMP/EE/BTP/WO/17/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	15-11-22
Type of Mix	:	Coarse Aggregate for WMM (Wet Mix Macadam)
Date of Test	:	15-11-22

Sl.No	Particulars of observations	Index	TEST 1	TEST 2
1	Total weight of the surface dry sample sample (passing 12.5 mm and retained on 10mm sieve)	A	300.2	300.2
2	Weight of fraction passing 2.36mm sieve After giving 15 blows	B	73.9	74.0
3	weight of fraction retained 2.36mm sieve After giving 15 blows	C	225.9	225.8
4	Total weight of (B+C) is less than the initial weight (Weight A) by more than one gram the result shall be discarded and a fresh test made.	A-(B+C)	0.4	0.4
5	Aggregate impact value	(B/A)*100	24.6	24.7
6	Aggregate impact value (Mean of two tests)	Pecentage	24.6	

* The results obtained are satisfactory as per standard requirements.

Note:-

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DETERMINATION OF FLAKINESS INDEX AND ELONGATION INDEX OF COARSE AGGREGATE(IS 2386 (Part 1) 1963 (RA 2007)

Lab ID	:	**CP-RW-2023-03-02-01** **Date: 17-11-22**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements of Roads Drains and Culverts in Ward No 10 (Doddabommasandra)
Agency	:	Sri. N M Shivakumar, No:7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.
Customer Reference	:	BBMP/EE/BTP/WO/17/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	15-11-22
Type of Mix	:	Coarse Aggregate for WMM (Wet Mix Macadam)
Date of Test	:	15-11-22

Result:

Index	Percentage of Flakiness and Elongation Index	Secified limits as per MORTH specification table 400-12
Flakiness Index	12.8%	Combined Flakiness & Elongation Index for WMM is Maximum 35%
Elongation Index	12.5%	
Combined Flakiness and Elongation Index for WMM	25.3%	

* The results obtained are satisfactory as per standard requirements.

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Format No: CP/TF/01

TEST REPORT ON BITUMEN

Lab ID	:	**CP-RW-2023-03-02-01** **Date: 21-11-22**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements of Roads Drains and Culverts in Ward No 10 (Doddabommasandra)
Agency	:	Sri. N M Shivakumar, No:7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.
Customer's Reference	:	BBMP/EE/BTP/WO/17/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	19-11-22
Sample Type	:	Bitumen
Reference to BIS codes	:	IS: 1201-2021, IS: 1202-1220(1978) (Reaffirmed-2019)
Date of Test	:	19-11-22

Test Results

Sl.no	Name of Test	Result	Requirements as per IS:73-2013
1	Penetration at 25°C , in 1/10th mm	**54**	Min. 45mm
2	Softening Point, °C	**51.2**	Min. 47°C
3	Ductility, cm	**78**	Min. 40cm
4	Flash point, °C	**245**	Min. 220°C
	Fire point, °C	**272**	

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TEST RESULTS OF GRADATION FOR BM
(IS 2386:(Part 1) 1963 (RA2011)

Lab ID	:	**CP-RW-2023-03-02-01** **Date: 25-11-22**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements of Roads Drains and Culverts in Ward No 10 (Doddabommasandra)
Agency	:	Sri. N M Shivakumar, No:7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.
Customer Reference	:	BBMP/EE/BTP/WO/17/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	23-11-22
Type of Mix	:	BM-Plant (Bituminous Macadam)
Date of Test	:	23-11-22
Weight of Sample(gm)	:	5000

IS Sieve Size(mm)	Weight Retained(gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Specification Limits as per MORTH specification Table 500-7(grading -2)
26.5	0	0	0	100	100
19	165	165	3.3	96.7	90-100
13.2	512	677	13.5	86.5	56-88
4.75	2759	3436	68.7	31.3	16-36
2.36	911	4347	86.9	13.1	4-19
0.3	358	4705	94.1	5.9	2-10
0.075	232	4937	98.7	1.3	0-8
PAN	63	5000	100.0	0.0	0

* The results obtained are satisfactory as per standard requirements.

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PHYSICAL REQUIREMENTS FOR COARSE AGGREGATE FOR BITUMINOUS MACADAM

Lab ID	:	**CP-RW-2023-03-02-01**	**Date: 26-11-22**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.	
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.	
Project Name	:	Improvements of Roads Drains and Culverts in Ward No 10 (Doddabommasandra)	
Agency	:	Sri. N M Shivakumar, No:7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.	
Customer Reference	:	BBMP/EE/BTP/WO/17/2020-21	
Source of Sample	:	Sample supplied by Agency	
Sample Condition	:	Satisfactory	
Date of Receipt	:	23-11-22	
Type of Mix	:	BM (Bituminous Macadam)	
Date of Test	:	23-11-22	

Table 500-6 : Physical Requirements fo Coarse Aggregate for Bituminous Macadam

Property	Test	Result	Specification	Method of Test
Partical Shape	Flakiness Index	13.8	Combined Flakiness & Elongation Index for BM is Maximum 35%	IS:2386 Part I
	Elongation Index	7.2		
Strength	Aggregate Impact Value	25.2	Maximum 30%	IS:2386 Part IV
Specific gravity	Specific gravity	2.51	Maximum 2.7	IS:2386 Part III
Water Absorption	Water Absorption	0.17	Maximum 2%	IS:2386 Part III

* The results obtained are satisfactory as per standard requirements.

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TEST REPORT OF AGGEGRATE STRIPPING VALUE OF ROAD AGGRGATE (IS:6241)

Lab ID	:	**CP-RW-2023-03-02-01** **Date: 26-11-22**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements of Roads Drains and Culverts in Ward No 10 (Doddabommasandra)
Agency	:	Sri. N M Shivakumar, No:7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.
Customer Reference	:	BBMP/EE/BTP/WO/17/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	23-11-22
Type of Mix	:	BM(Bitumnous Macadam)
Date of Test	:	23-11-22
Type of Binder	:	60/70
% of Binder Used	:	3.3%
Weight of Aggregate	:	200.0 gm
Weight of Binder	:	6.6 gm
Temperature of water bath	:	40°C

No of test	Retained Stripping Percentage	Stripping Percentage	Average Retained Stripping Percentage	Secified limits as per MORTH specification table 500-8
1	98.0	2.0	98.2	Minimum Retained Coating 95%
2	98.5	1.5		
3	98.0	2.0		

* The results obtained are satisfactory as per standard requirements.

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TESTS RESULTS ON STABILITY OF MIX

Lab ID	:	**CP-RW-2023-03-02-01** **Date: 26-11-22**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements of Roads Drains and Culverts in Ward No 10 (Doddabommasandra)
Agency	:	Sri. N M Shivakumar, No:7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.
Customer Reference	:	BBMP/EE/BTP/WO/17/2020-21
Source of Sample	:	Hot Mix Plant, Bangalore
Sample Condition	:	Satisfactory
Date of Receipt	:	23-11-22
Type of Mix	:	BM (Bituminous Mecadam)
Date of Test	:	23-11-22

The results of the tests conducted on the Bituminous Macadam mix sample are as follow

Sl.No	Particulars of observations	TEST 1	TEST 2	Secified limits as per MORTH specification table 500-11
1	Marshal Stability at 60°C, KN	11.29	11.82	9KN(Min)
2	Marshal flow at 60°C, mm	3.54	3.87	2-4
3	Percent air Voids	4.56	4.17	3-5
4	Percent Voids in mineral Aggregate(VMA %)	14.54	14.76	13-15
5	Percent Voids filled with Bitumen(VFB %)	68.98	70.28	65-75
6	Density, g/cc	2.42	2.40	–

* The results obtained are satisfactory as per standard requirements.

Note:-

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TEST RESULTS OF BITUMEN BINDAR CONTENT AND GRADATION FOR BM
(IS 2386:(Part 1) 1963 (RA2011)

Lab ID	:	**CP-RW-2023-03-02-01**	**Date: 06-12-22**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.	
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.	
Project Name	:	Improvements of Roads Drains and Culverts in Ward No 10 (Doddabommasandra)	
Agency	:	Sri. N M Shivakumar, No:7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.	
Customer Reference	:	BBMP/EE/BTP/WO/17/2020-21	
Source of Sample	:	Sample supplied by Agency	
Date of Receipt	:	05-12-22	
Type of Mix	:	BM (Bituminous Macadam)	
Date of Test	:	05-12-22	

Sl.no	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	W1	500	500
2	Weight of the sample After extraction	W2	485	484.5
3	Initial weight of Paper	W3	4	4
4	Final weight of Paper	W4	5.7	5.4
5	Increase in weight of Filter Paper	W5=W4-W3	1.7	1.4
6	Bitumen percentage	$\frac{W1-W2+W5}{W1}$ X 100	3.34	3.38
7	Average percentage	%	3.36	

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Lab ID : **CP-RW-2023-03-02-01** **Date: 06-12-22**

AFTER EXTRACTION(Trail-1)

Weight of Sample : 485 Grams

IS Sieve Size(mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Specification Limits as per MORTH specification Table 500-7(grading -2)
26.5	0	0	0.0	100.0	100
19	38	38	7.8	92.2	90-100
13.2	147	185	38.1	61.9	56-88
4.75	191	376	77.5	22.5	16-36
2.36	28	404	83.3	16.7	4-19
0.3	35	439	90.5	9.5	2-10
0.075	40	479	98.8	1.2	0-8

AFTER EXTRACTION(Trail-2)

Weight of Sample : 484.5 Grams

IS Sieve Size(mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Specification Limits as per MORTH specification Table 500-7(grading -2)
26.5	0	0	0.0	100.0	100
19	40	40	8.3	91.7	90-100
13.2	147	187	38.6	61.4	56-88
4.75	191	378	78.0	22.0	16-36
2.36	28	406	83.8	16.2	4-19
0.3	42	448	92.5	7.5	2-10
0.075	30	478	98.7	1.3	0-8

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TEST RESULTS OF GRADATION FOR BC
IS 2386 (Part 1) 1963 (RA 2007)

Lab ID	:	**CP-RW-2023-03-02-01** **Date: 01-12-22**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements of Roads Drains and Culverts in Ward No 10 (Doddabommasandra)
Agency	:	Sri. N M Shivakumar, No:7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.
Customer Reference	:	BBMP/EE/BTP/WO/17/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	29-11-22
Type of Mix	:	BC-Plant (Bituminous Concrete)
Date of Test	:	29-11-22
Oven Dry Weight	:	5000 Grams

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-17(grading-2)
19	0	0	0.0	100.0	100
13.2	89	89	1.8	98.2	90-100
9.5	702	791	15.8	84.2	70-88
4.75	895	1686	33.7	66.3	53-71
2.36	587	2273	45.5	54.5	42-58
1.18	492	2765	55.3	44.7	34-48
0.6	503	3268	65.4	34.6	26-38
0.3	528	3796	75.9	24.1	18-28
0.15	458	4254	85.1	14.9	12-20
0.075	350	4604	92.1	7.9	4-10
PAN	396	5000	100	0.0	0

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TEST REPORT OF AGGEGRATE STRIPPING VALUE OF ROAD AGGRGATE (IS:6241)

Lab ID	:	**CP-RW-2023-03-02-01** **Date: 02-12-22**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements of Roads Drains and Culverts in Ward No 10 (Doddabommasandra)
Agency	:	Sri. N M Shivakumar, No:7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.
Customer Reference	:	BBMP/EE/BTP/WO/17/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	29-11-22
Type of Mix	:	BC(Bitumenous Concrete)
Date of Test	:	29-11-22

Type of Binder	:	60/70
% of Binder Used	:	6.0%
Weight of Aggregate	:	200.0 gm
Weight of Binder	:	12.0 gm
Temperature of water bath	:	40°C

No of test	Retained Stripping Percentage	Stripping Percentage	Average Retained Stripping Percentage	Secified limits as per MORTH specification table 500-8
1	98.5	1.5	98.3	Minimum Retained Coating 95%
2	98.5	1.5		
3	98.0	2.0		

* The results obtained are satisfactory as per standard requirements.

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PHYSICAL REQUIREMENTS FOR COARSE AGGREGATE FOR BITUMINOUS CONCRETE

Lab ID	:	**CP-RW-2023-03-02-01**	**Date: 02-12-22**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.	
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.	
Project Name	:	Improvements of Roads Drains and Culverts in Ward No 10 (Doddabommasandra)	
Agency	:	Sri. N M Shivakumar, No:7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.	
Customer Reference	:	BBMP/EE/BTP/WO/17/2020-21	
Source of Sample	:	Sample supplied by Agency	
Sample Condition	:	Satisfactory	
Date of Receipt	:	29-11-22	
Type of Mix	:	BC (Bituminous Concrete)	
Date of Test	:	29-11-22	

Table 500-16 : Physical Requirements fo Coarse Aggregate for Bituminous Concrete

Property	Test	Result	Specification	Method of Test
Partical Shape	Flakiness Index	12.4	Combined Flakiness & Elongation Index for BC is Maximum 35%	IS:2386 Part I
	Elongation Index	11.8		
Strength	Aggregate Impact Value	22.1	Maximum 24%	IS:2386 Part IV
Specific gravity	Specific gravity	2.68	Maximum 2.7	IS:2386 Part III
Water Absorption	Water Absorption	0.21	Maximum 2%	IS:2386 Part III

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TESTS RESULTS ON STABILITY OF MIX

Lab ID	:	**CP-RW-2023-03-02-01** **Date: 02-12-22**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements of Roads Drains and Culverts in Ward No 10 (Doddabommasandra)
Agency	:	Sri. N M Shivakumar, No:7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.
Customer Reference	:	BBMP/EE/BTP/WO/17/2020-21
Source of Sample	:	Hot Mix Plant, Bangalore
Sample Condition	:	Satisfactory
Date of Receipt	:	29-11-22
Type of Mix	:	BC (Bituminous Concrete)
Date of Test	:	29-11-22

The results of the tests conducted on the Bituminous Concrete mix sample are as follow

Sl.No	Particulars of observations	TEST 1	TEST 2	Secified limits as per MORTH specification table 500-11
1	Marshal Stability at 60°C, KN	11.14	11.13	10KN(min)
2	Marshal flow at 60°C, mm	3.52	3.51	2-4
3	Percent air Voids	4.82	4.83	3-5
4	Percent Voids in mineral Aggregate(VMA %)	14.28	14.26	13-15
5	Percent Voids filled with Bitumen(VFB %)	71.87	71.63	65-75
6	Density, g/cc	2.25	2.26	–

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TEST RESULTS OF BITUMEN BINDAR CONTENT AND GRADATION FOR BC
IS 2386 (Part 1) 1963 (RA 2011)

Lab ID	:	**CP-RW-2023-03-02-01**	**Date: 07-12-22**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.	
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.	
Project Name	:	Improvements of Roads Drains and Culverts in Ward No 10 (Doddabommasandra)	
Agency	:	Sri. N M Shivakumar, No:7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.	
Customer Reference	:	BBMP/EE/BTP/WO/17/2020-21	
Source of Sample	:	Sample supplied by Agency	
Date of Receipt	:	06-12-22	
Type of Mix	:	BC (Bituminous Concrete), NA, 811 to 830& NA 810 to 795, Nagaland Colony	
Date of Test	:	06-12-22	

Sl.no	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	W1	500	500
2	Weight of the sample After extraction	W2	471	471.5
3	Initial weight of Paper	W3	4	4
4	Final weight of Paper	W4	5.5	5.8
5	Increase in weight of Filter Paper	W5=W4-W3	1.5	1.8
6	Bitumen percentage	$\frac{W1-W2+W5}{W1} \times 100$	6.10	6.06
7	Average percentage	%	6.08	

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R KARTHIK RECHAN
Authorized Signatory
Quality Manager

AEE (VRP) SD

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WATER TESTING | GEO TECHNICAL | PROJECT MANAGEMENT | SURVEYING SERVICES

Lab ID : **CP-RW-2023-03-02-01** **Date: 07-12-22**

AFTER EXTRACTION - Trail-1

Total Weight of the Sample(gm) : 471

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	6	6	1.3	98.7	90-100
9.5	60	66	14.0	86.0	70-88
4.75	115	181	38.4	61.6	53-71
2.36	86	267	56.7	43.3	42-58
1.18	30	297	63.1	36.9	34-48
0.6	12	309	65.6	34.4	26-38
0.3	44	353	74.9	25.1	18-28
0.15	42	395	83.9	16.1	12-20
0.075	56	451	95.8	4.2	4-10

AFTER EXTRACTION - Trail-2

Total Weight of the Sample(gm) : 471.5

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	4	4	0.8	99.2	90-100
9.5	62	66	14.0	86.0	70-88
4.75	112	178	37.8	62.2	53-71
2.36	88	266	56.4	43.6	42-58
1.18	29	295	62.6	37.4	34-48
0.6	11	306	64.9	35.1	26-38
0.3	46	352	74.7	25.3	18-28
0.15	45	397	84.2	15.8	12-20
0.075	55	452	95.9	4.1	4-10

* The results obtained are satisfactory as per standard requirements.

Note:-

The results pertain to the samples received and tested.
All information Furnished by Agency/ Representative
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Authorized Signatory
Quality Manager

End of Report

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TEST RESULTS OF BITUMEN BINDAR CONTENT AND GRADATION FOR BC
IS 2386 (Part 1) 1963 (RA 2011)

Lab ID : **CP-RW-2023-03-02-01** **Date: 08-12-22**

Customer : Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.

Address : Vidyaranyapura Sub Division, BBMP, Bangalore.

Project Name : Improvements of Roads Drains and Culverts in Ward No 10 (Doddabommasandra)

Agency : Sri. N M Shivakumar, No:7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.

Customer Reference : BBMP/EE/BTP/WO/17/2020-21

Source of Sample : Sample supplied by Agency

Date of Receipt : 07-12-22

Type of Mix : BC (Bituminous Concrete), NA 779 to 794 & NA 778 to 763

Date of Test : 07-12-22

Sl.no	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	W1	500	500
2	Weight of the sample After extraction	W2	471	471.5
3	Initial weight of Paper	W3	4	4
4	Final weight of Paper	W4	5.2	5.8
5	Increase in weight of Filter Paper	W5=W4-W3	1.2	1.8
6	Bitumen percentage	$\frac{W1-W2+W5}{W1} \times 100$	6.04	6.06
7	Average percentage	%	6.05	

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Lab ID : **CP-RW-2023-03-02-01** **Date: 08-12-22**

AFTER EXTRACTION - Trail-1

Total Weight of the Sample(gm) : 471

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	4	4	0.8	99.2	90-100
9.5	63	67	14.2	85.8	70-88
4.75	113	180	38.2	61.8	53-71
2.36	86	266	56.5	43.5	42-58
1.18	30	296	62.8	37.2	34-48
0.6	12	308	65.4	34.6	26-38
0.3	47	355	75.4	24.6	18-28
0.15	46	401	85.1	14.9	12-20
0.075	47	448	95.1	4.9	4-10

AFTER EXTRACTION - Trail-2

Total Weight of the Sample(gm) : 471.5

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	5	5	1.1	98.9	90-100
9.5	63	68	14.4	85.6	70-88
4.75	111	179	38.0	62.0	53-71
2.36	86	265	56.2	43.8	42-58
1.18	28	293	62.1	37.9	34-48
0.6	10	303	64.3	35.7	26-38
0.3	52	355	75.3	24.7	18-28
0.15	45	400	84.8	15.2	12-20
0.075	50	450	95.4	4.6	4-10

* The results obtained are satisfactory as per standard requirements.

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DETERMINATION OF RATE OF SPREAD TACK COAT

Lab ID	:	**CP-RW-2023-03-02-01** **Date: 07-12-22**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements of Roads Drains and Culverts in Ward No 10 (Doddabommasandra)
Agency	:	Sri. N M Shivakumar, No:7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.
Customer Reference	:	BBMP/EE/BTP/WO/17/2020-21
Sample Condition	:	Satisfactory
Date of Receipt	:	06-12-22
Type of Mix	:	Tack coat
Date of Test	:	06-12-22

Sl.No	Determination	Unit	TEST 1	TEST 2
1	Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30
2	Area of Plate (a)	Sq.mtr	0.09	0.09
3	Initial Wt of empty Plate (b)	Kg	0.78	0.748
4	Final weight of plate after application of tack Coat (c)	Kg	0.803	0.771
5	Weight of tack Coat (d=c-b)	Kg	0.023	0.023
6	Rate of spread of tack coat	Kg/sq.m	0.256	0.256
7	Average	Kg/sq.m	0.256	
8	Specified Limit	Kg/sq.m	0.250 Kg/sq.m	

* The results obtained are satisfactory as per standard requirements.

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